

What is claimed is;

1. An image recording medium comprising a support permeable to a reading electromagnetic wave and a first electrode layer permeable to the reading electromagnetic wave, a reading 5 photoconductive layer which exhibits conductivity upon exposure to the reading electromagnetic wave, a charge accumulating portion which accumulates an electric charge of a latent image polarity generated in a recording photoconductive layer, the recording photoconductive layer which exhibits 10 conductivity upon exposure to a recording electromagnetic wave and a second electrode layer permeable to the recording electromagnetic wave which are superposed on the support one on another in this order,

wherein at least one of the recording photoconductive 15 layer and the reading photoconductive layer is formed of a material containing a-Se as a major component and doped with a material for suppressing bulk crystallization of a-Se.

2. An image recording medium as defined in Claim 1 in which said material for suppressing bulk crystallization of 20 a-Se is As.

3. An image recording medium as defined in Claim 2 in which said at least one of the recording photoconductive layer and the reading photoconductive layer is doped with As in an amount of 0.1 to 0.5 atom%.

25 4. An image recording medium as defined in Claim 2 in which said at least one of the recording photoconductive layer

and the reading photoconductive layer is doped with Cl in addition to As.

5. An image recording medium as defined in Claim 4 in which said at least one of the recording photoconductive layer

5 and the reading photoconductive layer is doped with Cl in amount of 10 to 50ppm.

6. An image recording medium as defined in Claim 1 in which the recording photoconductive layer is 400 to 1000 $\mu\text{m}$  in thickness.

10 7. An image recording medium as defined in Claim 6 in which the recording photoconductive layer is 700 to 1000 $\mu\text{m}$  in thickness.

8. An image recording medium comprising a support permeable to a reading electromagnetic wave and a first electrode layer permeable to the reading electromagnetic wave, a reading photoconductive layer which exhibits conductivity upon exposure to the reading electromagnetic wave, a charge transfer layer which behaves like a substantially insulating material to an electric charge of a latent image polarity generated in 20 a recording photoconductive layer and behaves like a substantially conductive material to the electric charge of the polarity opposite to the latent image polarity, the recording photoconductive layer which exhibits conductivity upon exposure to a recording electromagnetic wave and a second 25 electrode layer permeable to the recording electromagnetic wave which are superposed on the support one on another in this order,

wherein the charge transfer layer is formed of a material containing a-Se as a major component and doped with a material for suppressing bulk crystallization of a-Se.

9. An image recording medium as defined in Claim 8 in  
5 which the charge transfer layer is doped with As in an amount of 0.1 to 0.5 atom% and with Cl in amount of 10 to 50 ppm.

10. An image recording medium as defined in Claim 8 in  
which the recording photoconductive layer is 400 to 1000  $\mu$ m in thickness.

10 11. An image recording medium as defined in Claim 10  
in which the recording photoconductive layer is 700 to 1000  $\mu$ m in thickness.

12. A method of manufacturing an image recording medium comprising a support permeable to a reading electromagnetic wave and a first electrode layer permeable to the reading electromagnetic wave, a reading photoconductive layer which exhibits conductivity upon exposure to the reading electromagnetic wave, a charge accumulating portion which accumulates an electric charge of a latent image polarity generated in a recording photoconductive layer, the recording photoconductive layer which exhibits conductivity upon exposure to a recording electromagnetic wave and a second electrode layer permeable to the recording electromagnetic wave which are superposed on the support one on another in this order,  
20  
25 the method characterized in that

the recording photoconductive layer is formed in a

thickness of 200 to 1000 $\mu\text{m}$  by resistance heating deposition of an alloy material containing therein Se as a major component and doped with 0.1 to 0.5 atom% of As and 10 to 50 ppm of Cl.

13. A method as defined in Claim 12 in which the recording

5 photoconductive layer is formed in a thickness of 400 to 1000 $\mu\text{m}$ .

14. A method as defined in Claim 13 in which the recording photoconductive layer is formed in a thickness of 700 to 1000 $\mu\text{m}$ .

15. A method of manufacturing an image recording medium comprising a support permeable to a reading electromagnetic 10 wave and a first electrode layer permeable to the reading electromagnetic wave, a reading photoconductive layer which exhibits conductivity upon exposure to the reading electromagnetic wave, a charge transfer layer which behaves like a substantially insulating material to an electric charge 15 of a latent image polarity generated in a recording photoconductive layer and behaves like a substantially conductive material to the electric charge of the polarity opposite to the latent image polarity, the recording photoconductive layer which exhibits conductivity upon 20 exposure to a recording electromagnetic wave and a second electrode layer permeable to the recording electromagnetic wave which are superposed on the support one on another in this order, the method characterized in that

the recording photoconductive layer is formed in a 25 thickness of 200 to 1000 $\mu\text{m}$  by resistance heating deposition of an alloy material containing therein Se as a major component

and doped with 0.1 to 0.5 atom% of As and 10 to 50 ppm of Cl.

16. A method as defined in Claim 15 in which the recording photoconductive layer is formed in a thickness of 400 to 1000  $\mu$ m.

17. A method as defined in Claim 16 in which the recording photoconductive layer is formed in a thickness of 700 to 1000  $\mu$ m.

18. An image recording medium comprising a support permeable to a reading electromagnetic wave and a first electrode layer permeable to the reading electromagnetic wave, a reading photoconductive layer which is formed of a material containing a-Se as a major component and exhibits conductivity upon exposure to the reading electromagnetic wave, a charge accumulating portion which accumulates an electric charge of a latent image polarity generated in a recording photoconductive layer, the recording photoconductive layer which exhibits conductivity upon exposure to a recording electromagnetic wave and a second electrode layer permeable to the recording electromagnetic wave which are superposed on the support one on another in this order, wherein between the first electrode layer and the reading photoconductive layer is provided an interfacial crystallization suppressing layer which is permeable to the reading electromagnetic wave and suppresses interfacial crystallization of a-Se.

19. An image recording medium as defined in Claim 18 in which the interfacial crystallization suppressing layer is 0.05 to 5  $\mu$ m in thickness.

20. An image recording medium as defined in Claim 19

in which the interfacial crystallization suppressing layer is  
0.1 to 0.5 $\mu$ m in thickness.

21. An image recording medium as defined in Claim 18  
in which the electrode of the first electrode layer is a stripe  
5 electrode comprising a plurality of line electrodes and said  
interfacial crystallization suppressing layer is provided  
continuously along the upper surface and the longitudinal side  
surfaces of each of the line electrodes.

22. An image recording medium as defined in Claim 18  
10 in which the electrode of the first electrode layer is of ITO.

23. An image recording medium as defined in Claim 18  
in which the interfacial crystallization suppressing layer is  
of an organic film.

24. An image recording medium as defined in Claim 23  
15 in which the organic film is of an organic polymer.

25. An image recording medium as defined in Claim 23  
in which the organic film is of a mixture of an organic binder  
and a low-molecular organic material.

26. An image recording medium comprising a support  
20 permeable to a reading electromagnetic wave and a first electrode  
layer permeable to the reading electromagnetic wave, a reading  
photoconductive layer which is formed of a material containing  
a-Se as a major component and exhibits conductivity upon exposure  
to the reading electromagnetic wave, a charge accumulating  
portion which accumulates an electric charge of a latent image  
25 polarity generated in a recording photoconductive layer, the

recording photoconductive layer which exhibits conductivity upon exposure to a recording electromagnetic wave and a second electrode layer permeable to the recording electromagnetic wave which are superposed on the support one on another in this order,

5 wherein the reading photoconductive layer is doped over the whole or in the surface area facing the first electrode layer with an interfacial crystallization suppressing material which suppresses interfacial crystallization of a-Se.

27. An image recording medium as defined in Claim 26  
10 in which said interfacial crystallization suppressing material is As.

28. An image recording medium as defined in Claim 27  
in which As is doped in an amount of 0.5 to 40atom%.

29. An image recording medium as defined in Claim 28  
15 in which the reading photoconductive layer is 0.05 to 0.5 $\mu$ m in thickness.

30. An image recording medium as defined in Claim 27  
in which Cl is doped in an amount of 1 to 1000ppm in addition to As.

20 31. An image recording medium as defined in Claim 27  
in which Na is doped in an amount of 1 to 1000ppm in addition to As.

32. An image recording medium as defined in Claim 26  
in which the interfacial crystallization suppressing material  
25 in the surface area forms a transparent interfacial crystallization suppressing layer which is 0.05 to 5 $\mu$ m in

thickness.

33. An image recording medium as defined in Claim 32 in which the transparent interfacial crystallization suppressing layer is 0.1 to 0.5 $\mu$ m in thickness.

5 34. An image recording medium as defined in Claim 25 in which the electrode of the first electrode layer is of ITO.

35. An image recording medium comprising a support permeable to a reading electromagnetic wave and a first electrode layer permeable to the reading electromagnetic wave, a reading 10 photoconductive layer which is formed of a material containing a-Se as a major component and exhibits conductivity upon exposure to the reading electromagnetic wave, a charge accumulating portion which accumulates an electric charge of a latent image polarity generated in a recording photoconductive layer, the 15 recording photoconductive layer which exhibits conductivity upon exposure to a recording electromagnetic wave and a second electrode layer permeable to the recording electromagnetic wave which are superposed on the support one on another in this order,

wherein an interfacial crystallization suppressing layer 20 which is permeable to the reading electromagnetic wave, suppresses interfacial crystallization of a-Se, and has a function of blocking the electric charge at which the first conductive layer is electrified from being injected into the reading photoconductive layer is provided between the first 25 electrode layer and the reading photoconductive layer, and the reading photoconductive layer is doped over the whole

or in the surface area facing the interfacial crystallization suppressing layer with an interfacial crystallization suppressing material which suppresses interfacial crystallization of a-Se and a material which increases traps for a charge of the polarity opposite to that at which the first electrode layer is electrified and reduces traps for the charge of the same polarity as the polarity at which the first electrode layer is electrified.

36. An image recording medium as defined in Claim 35  
10 in which said interfacial crystallization suppressing material is As.

37. An image recording medium as defined in Claim 36  
in which As is doped in an amount of 3 to 40atom%.

38. An image recording medium as defined in Claim 35  
15 in which the first electrode layer is positively electrified, and the material which increases traps for a charge of the polarity opposite to that at which the first electrode layer is electrified and reduces traps for the charge of the same polarity as the polarity at which the first electrode layer 20 is electrified is Cl.

39. An image recording medium as defined in Claim 38  
in which the doping amount of Cl is 1 to 1000ppm.

40. An image recording medium as defined in Claim 35  
in which the first electrode layer is negatively electrified,  
25 and the material which increases traps for a charge of the polarity opposite to that at which the first electrode layer

is electrified and reduces traps for the charge of the same polarity as the polarity at which the first electrode layer is electrified is Na.

41. An image recording medium as defined in Claim 40  
5 in which the doping amount of Na is 1 to 1000ppm.

42. An image recording medium as defined in Claim 35  
in which the thickness of the region doped with both the interfacial crystallization suppressing material and the material which increases traps for a charge of the polarity 10 opposite to that at which the first electrode layer is electrified and reduces traps for the charge of the same polarity as the polarity at which the first electrode layer is electrified is 0.01 to 0.1 $\mu$ m.

43. An image recording medium as defined in Claim 35  
15 in which the reading electromagnetic wave is 350 to 550nm in wavelength.

44. An image recording medium as defined in Claim 35  
in which the interfacial crystallization suppressing layer is of an organic film.

20 45. An image recording medium as defined in Claim 44  
in which the organic film is of an organic polymer.

46. An image recording medium as defined in Claim 44  
in which the organic film is of a mixture of an organic binder and a low-molecular organic material.

25 47. An image recording medium as defined in Claim 35  
in which the interfacial crystallization suppressing layer is

0.05 to 5 $\mu$ m in thickness.

48. An image recording medium as defined in Claim 47  
in which the interfacial crystallization suppressing layer is  
0.1 to 0.5 $\mu$ m in thickness.

5       49. An image recording medium as defined in Claim 35  
in which the electrode of the first electrode layer is a stripe  
electrode comprising a plurality of line electrodes and said  
interfacial crystallization suppressing layer is provided  
continuously along the upper surface and the longitudinal side  
10 surfaces of each of the line electrodes.

50. An image recording medium as defined in Claim 49  
in which the electrode of the first electrode layer is of ITO.

51. A method of manufacturing an image recording medium  
as defined in Claim 23 characterized in that material of said  
15 interfacial crystallization suppressing layer is applied in  
the longitudinal direction of the line electrodes.

52. A method of manufacturing an image recording medium  
as defined in Claim 49 characterized in that material of said  
interfacial crystallization suppressing layer is applied in  
20 the longitudinal direction of the line electrodes.